Environmental Resources Management, inc.

855 Springdale Drive • Exton, Pennsylvania 19341 • (215) 524-3500 • Telex 4900009249

16980

3 May 1989

Suzanne Billings
EPA Project Coordinator
USEPA Hazardous Waste
Enforcement Branch
841 Chestnut Building
Philadelphia, PA 19107

FILE: 720-01-16

Dear Suzanne:

This letter presents the sixth monthly report on the progress of the Eastern Diversified Metals (EDM) site Remedial Investigation/Feasibility Study. As provided by the 19 October, 1987 Administrative Order by Consent (Order), this report will relate the actions taken toward achieving compliance with the Order, transmit the results of testing or analysis, describe the anticipated date for receipt of results and the forthcoming schedule of activities, and report any problems that were encountered. This progress report will present activities performed in April, 1989.

Field Activities

Field activities during April included the description of subsurface soils, the description and sampling of solid waste via backhoe pits. Leachate/seep locations were also sampled as well as ground water for the second time. Surface water flow and static ground water level measurements were also obtained in April.

Subsurface soils were inspected via backhoe pits in six locations around the site on 11 April (see Figure 1) to provide information on soil horizonation, overburden lithology and the presence of water entry zones in the soil/overburden. The soil profile was described and logged by a soil scientist with notations on soil color, texture, structure, consistence, coarse fragment content and any other pertinent features. The depth of water entry zones were noted, and water was collected for the measurement of specific conductance as an indication of leachate content. These measurements are shown on Table 1.

Four backhoe pits were also excavated in the solid waste pile on 12 April, as shown in Figure 1. These were installed in order to allow the observation of the fluff in situ, and to facilitate the sampling of the

fluff for geotechnical analyses. These analyses are to include sieve analysis for particle size, compaction testing, and shear testing.

Samples were also collected at four seep locations on 10 April, as depicted on Figure 1. These samples are to be analyzed for Target Compound List (TCL) volatile organics, semivolatile organics, pesticides and PCBs, and Target Anylate List inorganics. Two of these locations were the main leachate seep and the seep downstream of the waste water treatment plant, as specified in the Remedial Investigation Site Operations Plan (RISOP). A third sample was collected downstream of the one below the treatment plant; the location of this sample was selected in coordination with the EPA via an inspection of downstream seeps for flow, color and odor. The fourth seep location was originally to have been the secondary seep, but since this location was not flowing at the time of sampling a different seep location was sampled in its place. This last location was a seep from the bank of the intermittent stream in the vicinity of the Equalization Basin. The results of field specific conductance measurements on these seeps are presented in Table 1.

Ground water was sampled for the second time during the week of 17 April. Each of the monitoring wells containing a sufficient column of static water was purged and sampled following a round of static water levels (Table 2). MW-1/O, MW-2/O and MW-7/O were not sampled due to a lack of water. Samples for the remaining wells were submitted for the analysis of TCL volatile organics. Samples from MW-1/S and MW-1/I were also submitted for TCL semivolatile analysis due to the missing of holding times for samples from these wells during the previous round of analyses.

On 3 April a round of surface water flow measurements was obtained at the site. These included measurements at the three weirs, the pipe influent to the Equalization Basin, the effluent pipe from the treatment plant and the western diversion culvert at its terminus. The results of these measurements are presented in Table 3. All surface water flow measurements were taken by timing the filling of a two-gallon bucket. At the weirs, this flow was that through the notch. Gage readings were not taken as they would be inaccurate since the weirs were leaning. Static ground water level measurements were also obtained on 3 April. These are presented in Table 2.

Results

The results of field measurements are presented in Tables 1, 2, and 3. Analytical results for the leachate/seep and ground water samples are expected in the end of May.

Anticipated Activities in the Coming Month

Two additional tasks will be performed in May as agreed with EPA. These will include an interim report on the review of analytical data from the surface water and stream bed sediment samples in comparison with the bioassay analyses from the two intermittent stream sample locations. This report will discuss the potential sources of the toxicity detected in the bioassay test, and make recommendations for any further action that may be called for. In addition, two samples will be obtained and analyzed for dioxin and dibenzofurans. One of these samples will come from the fluff in the area that burned during the former fire. The other sample will be of the surface soil at the perimeter of the site. This location will be chosen based on the wind direction on the day of the fire to assess potential wind-aided transport of combusted materials. This sampling is anticipated for the second week of May.

The next monthly report is due on 2 June 1989. If you have any questions regarding this report, please call.

Sincerely,

David P. Steele
Project Manager

Marilyn A. Hewitt, P.G.
Project Director

cc: Richard Beldner, Esq.
William Powers, Esq.
Bruce Rapp
Michael Steinberg, Esq.
Heather Winett, Esq.
Virginia Nicholas, GCL
Bob Lewis, PADER

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The ERM Group

Figure 1 Locations of Monitoring Wells and Other April Sampling Points

Eastern Diversified Metals
Remedial Investigation

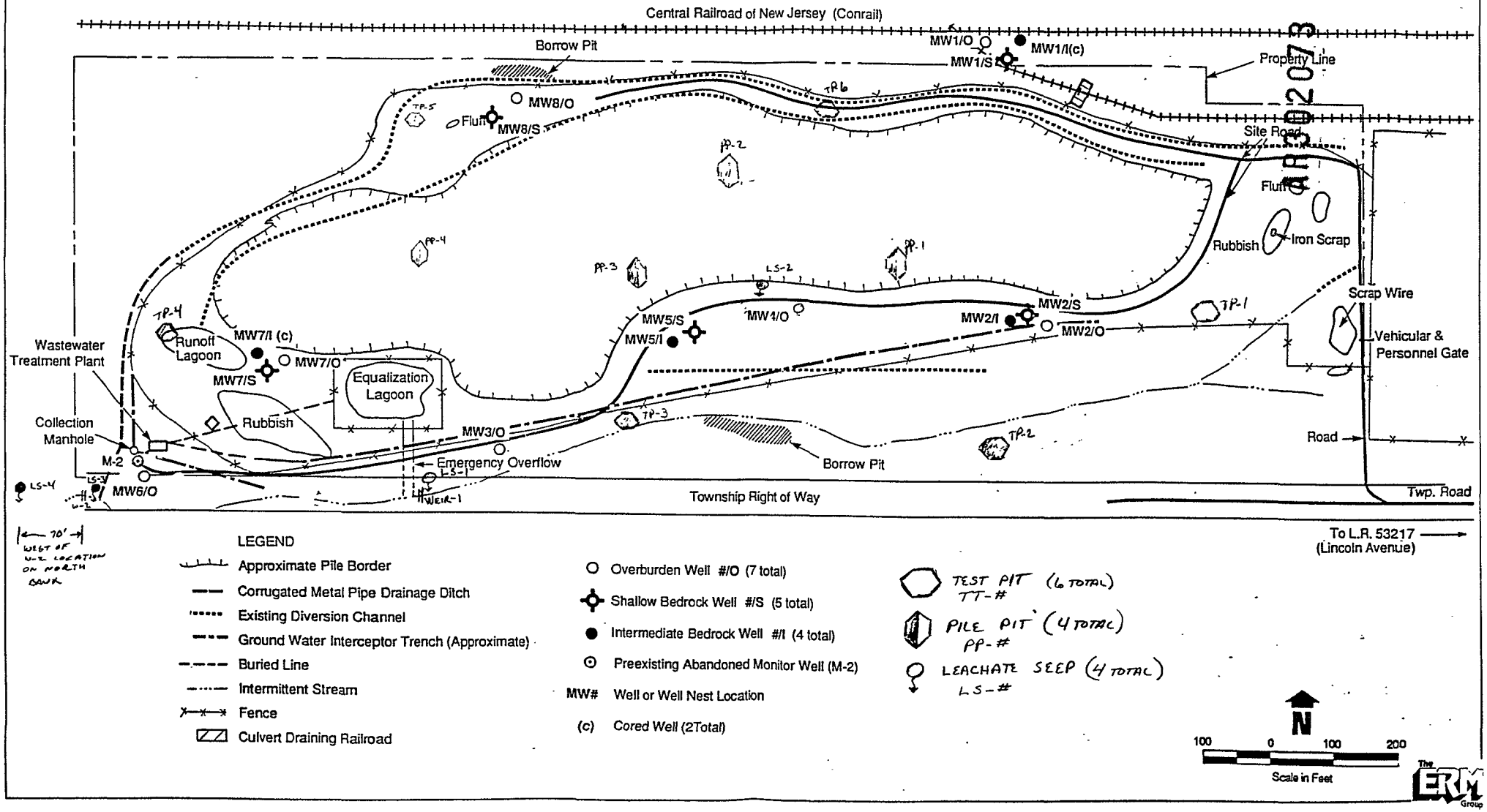

TABLE 1
SPECIFIC CONDUCTANCE MEASUREMENTS ON SEEPS
EASTERN DIVERSIFIED METALS, HOMETOWN,PA.

MEDIA	IDENTIFICATION	DEPTH (FEET)	SPECIFIC CONDUCTANCE (uMHO/CM)	Notes
Subsurface Soil	TP-1	2.4	35	Top 2.4 feet was saturated fluff. Source was pool on surface approx. 5 ft. away.
	TP-2	- - -	- - -	No water encountered.
	TP-3	5.0	50	Flow over pan.
	TP-4	6.0	- - -	Insufficient flow for collection.
	TP-5	- - -	- - -	No water encountered.
	TP-6	5.5	- - -	Insufficient flow for collection.
Leachate/ Seep	LS-1		65	Seep near Equalization Basin.
	LS-2		329	Main leachate seep.
	LS-3		135	Immediately downstream of treatment plant.
	LS-4		150	70 ft. downstream of LS-3.

TABLE 2
WATER LEVEL READINGS
EASTERN DIVERSIFIED METALS, HOMETOWN,PA.

WELL	DEPTH TO BOTTOM FROM GROUND LEVEL (FEET)	CASING STICK-UP (FEET)	28 OCT.88 DEPTH TO WATER T.O.C.(FEET)	14 NOV.88 D.T.W. T.O.C.(FEET)	6 DEC. 88 D.T.W. T.O.C.(FEET)	6 JAN. 89 D.T.W. T.O.C.(FEET)	3 APR. 89 D.T.W. T.O.C.(FEET)	17 APR. 89 D.T.W. T.O.C.(FEET)
1/O	19	1.9	DRY	DRY	DRY	DRY	DRY	DRY
1/S	55	1.9	34.66	31.98	29.20	32.3	24.02	29.08
1/I	85	1.6	33.12	30.65	28.09	30.93	23.23	27.89
2/O	15.5	2.1	DRY	DRY	DRY	DRY	DRY	DRY
2/S	55	2.3	45.56	45.14	42.10	43.61	39.48	38.72
2/I	80	1.8	52.40	51.60	48.56	50.09	45.4	45.57
3/O	16	1.8	9.32	8.84	7.60	8.1	6.62	6.58
4/O	24.2	0.7	DRY	DRY	DRY	DRY	21.64	21.34
5/S	45	1.7	25.35	24.55	21.0	22.57	17.35	17.19
5/I	75	1.7	23.38	22.47	19.0	20.93	15.31	15.08
6/O	18.4	1.8	13.88	12.72	12.36	13.04	11.28	11.8
7/O	16	1.9	17.50	17.56	17.50	17.51	DRY	17.5
7/S	60	1.9	45.38	45.21	40.81	38.65	35	35.35
7/I	90	1.8	68.26	66.50	63.95	65.37	60.7	61.28
8/O	13	1.7	9.79	9.21	9.11	8.98	8.94	9.03
8/S	43.5	1.3	16.70	15.11	15.83	16.23	14.66	15.16
PB-1	37.5	2	27.71	27.25	-	28.01	27.5	27.31
PB-2	42	-	DRY	DRY	DRY	-	DRY	DRY
SG-1	-	-	-	-	0.32	0.37	0.31	-
SG-2	-	-	-		0.25	0.29	0.25	-

WELL DESIGNATIONS ARE AS FOLLOWS: MW-#/OVERBURDEN, SHALLOW, INTERMEDIATE.
"FLUFF" PILE BORINGS ARE DESIGNATED AS: PB-#
STREAM GAGES APPEAR AS: SG-#

TABLE 3
SURFACE WATER FLOW MEASUREMENTS DURING THE EDM RI/FS
SIXTH MONTHLY REPORT 3 MAY 1989

STREAM FLOW

Station	Date	Head (FT)	Calculated Flow (CFS)	Calculated Flow (GPM)	Calibrated Flow (GPM)	Estimated Leakage (GPM)	Notes
Weir 1	9/9/88	0	0.013	6.0		0.5 to 1	
	9/15/88	0	0.013	6.0	5.1	0.5	approx. 1.5 in. rain on 9/12/88
	4/3/89				13	3	Flow thru notch in weir into 2 gal. bucket
Weir 2	9/9/88	0	0.03	13		2	
	9/15/88	0	0.023	11	20		weir leans approx 35 deg. from vertical, necessary to seal.
	4/3/89				54	5	Flow thru notch in weir into 2 gal. bucket
Weir 3	9/9/88	0	0.041	18		3 to 4	
	9/15/88	0	0.045	20	31	1	weir leans approx 20 deg. from vertical, necessary to seal.
	4/3/89				84	5	Flow thru notch in weir into 2 gal. bucket

		Bucket Vol. (GAL)	Time (SEC)	Flow (GPM)	Notes
CMP -W. Ditch	9/15/88	3	187	0.96	
	4/3/89	2	9.19	13	
CMP-Eq. Lagoon	9/15/88	3	37	4.9	CMP dia. = 3 FT, slope = 3 DEG, depth of flow = 0.08 FT
	4/3/89	2	28.6	4	
Effluent Pipe	4/3/89	2	2.84	42	

ASI BIOMONITORING REPORT #746
ASI Job # 2119

7-DAY STATIC DAILY-RENEWAL SHORT-TERM CHRONIC TOXICITY TESTS WITH Ceriodaphnia dubia and Pimephales promelas

GENERAL

Test Facility: Aqua Survey, Inc.
499 Point Breeze Road
Flemington, New Jersey 08822
(201) 788-8700

Client: Environmental Resources Management, Inc.
Exton, PA
Laboratory Coordinator: Susan Barry

Date(s) of Toxicity Test: November 8-15, 1988 (P. promelas)
November 8-15, 1988 (C. dubia)

BACKGROUND

The two short-term (7-day) chronic toxicity tests described in this report were performed for Environmental Resources Management Inc. of Exton, Pennsylvania. These tests were conducted to determine the toxicity, if any, of surface water adjacent to the Eastern Diversified Metals site.

TOXICITY SUMMARY

Chronic toxicity tests conducted for ERM in November 1988 with Ceriodaphnia dubia and the Fathead Minnow (Pimephales promelas) indicated that the test material was toxic to both species. Significantly increased mortality and reduced growth rates were found with P. promelas in the 40, 60, 80 and 100% treatments. P. promelas growth rates were not reduced in treatments below 40%

Ceriodaphnia dubia exhibited significantly increased mortality in the 100% treatment. C. dubia reproduction was not inhibited with increased concentration.

METHODS

Effluent & Diluent Sampling:

Effluent- A grab sample of effluent was collected on 11/7/88 by ERM personnel. Samples were collected in 10-gallon polyethylene containers and immediately transported to the ASI Laboratory in Flemington, NJ.

Diluent- Water obtained from Round Valley Reservoir (Hunterdon County, NJ) was used as dilution water in the bioassays. This water was filtered to 0.45 um before use.

Testing:

Chronic toxicity tests were conducted in accordance with EPA Test Methods 1000.0 and 1002.0 (EPA/600/4-85/014, 1985). _Ceriodaphnia dubia (<24 hours old, within 4 hours) and Pimephales promelas (<24 hours old) were the test species used.

Experimental Design:

For C. dubia: 1 organism/test chamber, 10 replicates/treatment
1 control treatment and 10, 20, 40, 60, 80 & 100% effluent concentrations.

For P. promelas: 10 organisms/test chamber, 3 reps/treatment
1 control and 10, 20, 40, 60, 80 & 100% effluent concentrations.

Effects Measured:

For C. dubia: Survival (immobility) & reproduction

For P. promelas: Survival & Growth (weight)

RESULTS

Table 1. Results of 7-Day Survival and Reproduction Bioassay with Ceriodaphnia dubia.

Effl Conc	Day #	Repro/Replicate A	B	C	D	E	F	G	H	I	J	#Live Young	#Live Adults	Mean Young	Most Young
0%	2	2	0	0	0	0	2	1	2	0	1	8	10	0.8	2
	3	2	4	4	4	3	2	2	4	0	0	25	10	2.5	4
	4	3	7	4	8	0	6	0	0	8	2	38	10	3.8	8
	5	8	5	9	0	5	11	5	8	0	6	57	10	5.7	11
	6	10	0	0	13	13	11	8	11	0	8	74	10	7.4	13
	7	0	11	0	12	11	0	9	13	0	0	56	10	5.6	13
		25	27	17	37	32	32	25	38	8	17	258			
10%	2	0	0	1	0	0	0	0	0	0	1	2	10	0.2	1
	3	4	4	3	4	4	0	4	3	2	3	31	10	3.1	4
	4	7	8	5	7	7	2	0	4	4	6	50	10	5.0	8
	5	11	7	7	0	0	7	6	7	0	7	52	10	5.2	11
	6	0	0	0	10	10	12	10	0	6	0	48	10	4.8	12
	7	9	10	11	7	11	11	10	9	11	12	101	10	10.1	12
		*32	29	27	28	32	32	30	23	23	29	285			
20%	2	0	0	0	1	0	0	3	0	0	0	4	10	0.4	3
	3	4	4	4	3	4	3	1	2	4	3	32	10	3.2	4
	4	4	0	7	4	0	0	6	6	8	0	35	10	3.5	8
	5	0	8	0	9	8	6	8	0	0	4	43	10	4.3	9
	6	9	10	12	0	11	11	7	8	9	9	86	10	8.6	12
	7	10	11	5	14	14	11	1	11	13	9	99	10	9.9	14
		27	33	28	31	37	31	26	*28	34	25	299			
40%	2	0	0	0	0	0	0	0	0	0	0	0	10	0.0	0
	3	4	4	5	4	6	2	4	4	3	4	40	10	4.0	6
	4	6	5	0	6	D7	0	6	0	8	7	45	9	4.5	8
	5	0	0	8	0	-	5	0	6	7	5	31	9	3.1	8
	6	8	9	10	7	-	9	7	11	0	1	62	9	6.2	11
	7	11	13	10	8	-	8	14	11	7	8	90	9	9.0	14
		29	31	33	25	13	24	31	32	25	25	268			

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* A single young produced in the second 24-hour period (which does not appear in the table) accounts for the discrepancy.

Table 1. Results of 7-day Survival and Reproduction Bioassay with Ceriodaphnia dubia (continued).

Effl Conc	Day #	Repro/Replicate A	B	C	D	E	F	G	H	I	J	#Live Young	#Live Adults	Mean# Young	Most Young
60%	2	0	0	0	0	0	0	0	0	0	0	0	10	0.0	0
	3	6	4	4	3	4	2	2	2	2	0	29	10	2.9	6
	4	0	0	4	0	0	4	0	4	4	0	16	10	1.6	4
	5	4	0	0	4	6	7	5	0	6	3	35	10	3.5	7
	6	9	9	9	8	6	1	8	6	0	0	56	10	5.6	9
	7	11	10	9	11	7	9	8	10	9	9	93	10	9.3	11
		30	23	26	26	23	23	23	22	21	12	229			
80%	2	0	0	0	0	0	2	1	0	0	0	3	10	0.3	2
	3	2	2	3	4	3	2	2	3	2	3	26	10	2.6	4
	4	1	0	0	4	0	0	0	0	0	3	8	10	0.8	4
	5	4	4	5	0	4	6	3	4	5	0	35	10	3.5	6
	6	8	9	10	8	9	12	4	6	9	7	82	10	8.2	12
	7	9	8	13	12	11	12	0	10	11	12	98	10	9.8	13
		24	23	31	28	27	34	10	23	27	25	252			
100%	2	-	0	0	0	2	0	0	-	D	1	3	7	0.3	0
	3	-	4	3	3	2	1	3	-	-	0	16	7	1.6	4
	4	-	0	0	0	0	4	0	-	-	3	7	7	0.7	4
	5	-	7	4	4	3	0	6	-	-	9	33	7	3.3	9
	6	-	10	8	8	7	8	5	-	-	D	46	6	4.6	10
	7	-	12	8	11	8	10	9	-	-	-	58	6	5.8	12
		0	33	23	26	22	23	23	0	0	13	163			

RESULTS (continued)

Table 2. Results of 7-Day Survival and Growth Bioassay with Fathead Minnow Larvae (*Pimephales promelas*).

Test Concentration (%) & Replicate	Survival (%)	Average Dry Weight (mg)
0 a	90	0.033
b	100	0.029
c	90	0.029
10 a	90	0.029
b	100	0.026
c	90	0.026
20 a	100	0.025
b	100	0.027
c	90	0.024
40 a	90	0.012
b	70	0.019
c	90	0.013
60 a	80	0.014
b	80	0.005
c	20	0.025
80 a	0	0.000
b	0	0.000
c	0	0.000
100 a	0	0.000
b	0	0.000
c	0	0.000

DATA ANALYSIS

Data from the chronic bioassay of C. dubia demonstrated that statistically significant mortality was caused by the effluent in the 100% treatment (p = 0.5). The NOEC = 80% and the LOEC = 100% for C. dubia, with a chronic value (ChV) of 89.4%. There was no observable effect on reproduction in any of the treatments below 100% .

Data from the chronic bioassay of P. promelas. indicated that statistically significant mortality occurred in the 60, 80 and 100% treatments, while significant reduction in growth was evident in the 40 & 60% treatment (p = 0.5). The NOEC = 20% and LOEC = 40% for P. promelas, with a ChV of 28.3%.

Cindy Roberts
Chronic Studies Manager

CLIENT CIBA LOCATION HOMETOWN, PA ORGANISM P. PROMELAS

SET UP DATE: 07 NOV '88 CALIBRATED ON SITE

STARTING DATE: 08 NOV '88 CALIBRATED OTHER ASI FLEMINGTON, N.J.

BIO 1 UPSTREAM

DOSE %	LIVE COUNT 0% 0	1	2	3	4	5	6	7		LIVE COUNT 10%	0	1	2	3	4	5	6	7
0 A	10	10	10	10	10	10	10	9¹	9	10 A	10	10	10	10	10	10	10	9¹
B	10	10	10	10	10	10	10	10	10	B	10	10	10	10	10	10	10	10
C	10	10	10	10	9¹	9	9	9		C	10	10	10	10	10	9¹	9	9
					20%										40%			
20 A	10	10	10	10	10	10	10	10		40 A	10	10	10	10	10	10	9¹	9
B	10	10	10	10	10	10	10	10		B	10	10	8²	8	7¹	7	7	7
C	10	10	10	10	10	9¹	9	9		C	10	10	10	10	9¹	9	9	9
					60%										80%			
60 A	10	10	9¹	8¹	8	8	8	8		80 A	10	7³	0⁷	-	-	-	-	-
B	10	10	9¹	9	8¹	8	8	8		B	10	9¹	5⁴	4¹	2²	1¹	0¹	-
C	10	10	10	10	6⁴	5¹	4¹	2²		C	10	8²	2⁶	1¹	0¹	-	-	-
					100%													
00 A	10	0¹⁰	-	-	-	-	-	-	-									
B	10	1⁹	0¹	-	-	-	-	-	-									
C	10	1⁹	0¹	-	-	-	-	-	-									

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ORGANISM LOG # _____

RTING DATE: 08 NOV 88 CALIBRATED _____ OTHER ASI FLEMINGTON N.J.

BIO 1 UPSTREAM

DOSE %	pH								TEMPERATURE °C							
	0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7
0	7.7	7.7	7.7	7.7	7.8	7.8	7.8		0	25.0	24.0	25.0	24.5	25.0	25.0	25.0
10	7.6	7.6	7.7	7.6	7.7	7.7	7.6		10	25.0	24.0	25.0	25.0	25.0	25.0	25.0
20	7.5	7.5	7.6	7.6	7.6	7.6	7.5		20	25.0	24.0	24.5	25.0	25.0	25.0	25.0
40	7.3	7.2	7.4	7.5	7.3	7.3	7.2		40	25.0	24.5	24.5	25.5	25.0	25.0	25.0
60	7.1	7.0	7.2	7.2	7.1	7.1	6.9		60	24.5	24.5	24.0	25.5	25.0	25.0	25.0
80	6.8	6.7	6.9	7.0	7.0	7.0	6.7		80	24.5	24.5	24.0	26.0	25.0	25.0	25.0
100	6.5	—	—	—	—	—	—	—	100	24.0	24.5	24.0	—	—	—	—
	K	K	K	K	↕					K	K	K	K	K		K
					0 7.7											
					10 7.8											
					20 7.7											
					40 7.4											
					60 7.1											
					K 6.9											

AR302084

ORGANISM LOG / _____

NG DATE: 04 NOV YY CALIBRATED _____ OTHER AST FLEMINGTON N.J

BIO 1 UPSTREAM

DOSE %	DISSOLVED OXYGEN 0	1	2	3	4	5	6	7
0	6.8	7.0	7.0	7.2	7.4	7.4	7.4	
10	7.4	7.6	7.2	7.2	7.5	7.5	7.4	
20	7.6	7.6	7.8	7.8	7.7	7.7	8.0	
40	8.0	8.0	8.0	7.2	8.2	8.2	8.2 8.6	
60	8.2	8.2	8.8	8.0	8.6	8.6	8.6	
80	8.4	8.6	9.4	8.6	8.4	8.4	9.0	
100	8.6	8.6	–	–	–	–	–	–
	(C)	(C)	(C)	(C)	⇕		(C)	
					C 7.2			
					10 7.4			
					20 7.4			
					40 7.6			
					60 8.0			
					80 8.0			

ORGANISM LOG # _____

AR302085

DATE: 08 NOV 88 CALIBRATED _____ ON SITE _____

RTING DATE: 08 NOV 88 CALIBRATED _____ OTHER ASI FLEMINGTON N.J.

BIO 1 UPSTREAM

DOSE %	D.O. AFTER 1	2	3	4	5	6	7			D.O. AFTER (cont'd) 1	2	3	4	5	6	7	
0 A	6.8	7.2	6.8	7.2	7.0	7.4	7.0			100 A	7.6	7.6	—	—	—	—	—
B	6.8	7.0	7.0	7.2	7.1	7.0	7.0			B	7.6	7.8	—	—	—	—	—
C	7.0	7.2	7.0	7.2	7.0	7.0	6.6			C	7.6	7.6	—	—	—	—	—
10 A	7.2	7.0	6.8	7.2	6.9	7.4	6.8				(K)	(K)					
B	7.2	7.0	7.0	7.2	7.0	7.2	6.4										
C	7.2	7.0	7.0	7.4	7.0	7.0	6.8										
20 A	7.2	7.2	6.8	7.2	7.2	7.6	6.2										
B	7.2	7.2	7.0	7.0	7.0	7.4	6.2										
C	7.0	7.2	7.0	7.2	7.1	7.4	6.2										
40 A	7.2	7.0	7.2	7.2	6.8	7.4	6.6										
B	7.0	7.0	7.0	7.2	6.9	7.4	6.6										
C	7.0	7.0	7.2	7.2	7.1	7.2	6.2										
60 A	7.2	7.2	7.0	7.2	7.4	7.4	7.0										
B	7.2	7.2	6.8	7.2	7.2	7.2	6.4										
C	7.2	7.0	6.8	7.4	7.2	7.4	7.0										
80 A	7.2	7.0	—	—	—	—	—										
B	7.0	7.0	7.0	7.2	7.1	7.4	—										
C	7.2	7.2	7.2	7.2	—	—	—										
	(K)	(K)	(K)	(K)	E												

AR302086

ORGANISM LOG # _____

_M LOCATION HOMETOWN PA ORGANISM F. PROMELAS

DATE: 08 NOV 88 CALIBRATED _____ ON SITE _____

STING DATE: 08 NOV 88 CALIBRATED _____ OTHER ASI FLEMINGTON N.J.

Sio 1 upstream

DOSE %	Alk								Hardness							
	0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7
0	40	40	40	40	40	40	40		48	52	52	50	50	48	52	
10																
20																
40																
60																
80		16	16	16	20	16	16			40	36	40	40	36	32	
100	16	-	-	-	-	-	-	-	28	-	-	-	-	-	-	-
				E	E		E					E	E		E	

AR302087

ORGANISM LOG # _____

:M LOCATION HOMETOWN PA ORGANISM P. PROMELAS

DATE: 08 NOV 88 CALIBRATED _____ ON SITE _____

STARTING DATE: 08 NOV 88 CALIBRATED _____ OTHER ASI FLEMINGTON N.J.

Bio 1 upstream

DOSE %	Conductivity 0	1	2	3	4	5	6	7
0	130	130	130	130	130	125	130	
10	120	120	120	130	120	120	130	
20	120	120	120	120	120	120	130	
40	110	110	110	110	110	110	120	
60	100	100	100	100	100	100	110	
80	90	90	90	90	90	85	100	
100	80							
			E	E	E		E	

BR302068

ORGANISM LOG # _____

SET UP DATE: OK NOV 88 CALIBRATED _____ ON SITE _____

STARTING DATE: OK NOV 88 CALIBRATED _____ OTHER ASI FLEMINGTON N.J.

B10 1 UPSTREAM

DOSE %	LIVE COUNT 0%									LIVE COUNT 10%								
	0	1	2	3	4	5	6	7		0	1	2	3	4	5	6	7	
A	✓	✓	✓ 2	✓ 2	✓ 3	✓ 8	✓ 10	✓	25	A	✓	✓ 1	✓	✓ 4	✓ 7	✓ 11	✓	✓ 9	39
B	✓	✓	✓	✓ 4	✓ 7	✓ 5	✓	✓ 11	27	B	✓	✓	✓	✓ 4	✓ 8	✓ 7	✓	✓ 10	29
C	✓	✓	✓	✓ 4	✓ 4	✓ 9	✓	✓	17	C	✓	✓	✓ 1	✓ 3	✓ 5	✓	✓	✓ 11	20
D	✓	✓	✓	✓ 4	✓ 8	✓	✓ 13	✓ 12	37	D	✓	✓	✓	✓ 4	✓ 7	✓	✓ 10	✓ 7	28
E	✓	✓	✓	✓ 3	✓	✓ 5	✓ 13	✓ 11	32	E	✓	✓	✓	✓ 4	✓ 7	✓	✓ 10	✓ 11	32
F	✓	✓	✓ 2	✓ 2	✓ 6	✓ 11	✓ 11	✓	32	F	✓	✓	✓	✓	✓ 2	✓ 7	✓ 12	✓ 11	32
G	✓	✓	✓ 1	✓ 2	✓	✓ 5	✓ 8	✓ 9	25	G	✓	✓	✓	✓ 4	✓	✓ 6	✓ 10	✓ 10	30
H	✓	✓	✓ 2	✓ 4	✓	✓ 8	✓ 11	✓ 13	38	H	✓	✓	✓	✓ 3	✓ 4	✓ 7	✓	✓ 9	23
I	✓	✓	✓	✓	✓ 8	✓	✓	✓	4	I	✓	✓	✓	✓ 2	✓ 4	✓	✓ 6	✓ 11	23
J	✓	✓	✓ 1	✓	✓ 2	✓ 6	✓ 8	✓	17	J	✓	✓	✓ 1	✓ 3	✓ 6	✓ 7	✓	✓ 12	29
	(K)	(K)	(K)	(K)	(K)		(K)	(K)	258		(K)	(K)	(K)	(K)	(K)		(K)	(K)	255

AR302089

ORGANISM LOG # _____

ING DATE: 07 NOV 88 CALIBRATED _____ OTHER ASI FLEMINGTON N.J.

BIO 1 UPSTREAM

DISE %	LIVE COUNT 20%										LIVE COUNT 40%									
	0	1	2	3	4	5	6	7			0	1	2	3	4	5	6	7		
A	✓	✓	✓	✓4	✓4	✓	✓9	✓10	27	A	✓	✓	✓	✓4	✓6	✓	✓8	✓11	29	
B	✓	✓	✓	✓4	✓	✓8	✓10	✓11	33	B	✓	✓	✓	✓4	✓5	✓	✓9	✓13	31	
C	✓	✓	✓	✓4	✓7	✓	✓12	✓5	28	C	✓	✓	✓	✓5	✓	✓8	✓10	✓10	33	
D	✓	✓	✓1	✓3	✓4	✓9	✓	✓14	31	D	✓	✓	✓	✓4	✓6	✓	✓7	✓8	25	
E	✓	✓	✓	✓4	✓	✓8	✓11	✓14	37	E	✓	✓	✓	✓6	D 7	–	–	–	13	
F	✓	✓	✓	✓3	✓	✓6	✓11	✓11	31	F	✓	✓	✓	✓2	✓	✓5	✓9	✓8	24	
G	✓	✓	✓3	✓1	✓6	✓8	✓7	✓1	26	G	✓	✓	✓	✓4	✓6	✓	✓7	✓14	31	
H	✓	✓1	✓	✓2	✓6	✓	✓8	✓11	28	H	✓	✓	✓	✓4	✓	✓6	H ✓	11 ✓	32	
I	✓	✓	✓	✓4	✓8	✓	✓9	✓13	34	I	✓	✓	✓	✓3	✓8	✓7	✓	✓	25	
J	✓	✓	✓	✓3	✓	✓4	✓9	✓9	25	J	✓	✓	✓	✓4	✓7	✓5	✓1	✓8	25	
	(K)	(K)	(K)	(K)	(K)		(K)	(K)	300		(K)	(K)	(K)	(K)	(K)		(K)	(K)	268	

AR302090

RGANISM LOG / _____

P DATE: OX NOV 88 CALIBRATED ____ ____ ON SITE ____

RTING DATE: OX NOV 88 CALIBRATED ____ ____ ...ED ASI FLEMINGTON, N.J.

BIO 1 UPSTREAM

DOSE %	LIVE COUNT 60% 0	1	2	3	4	5	6	7		LIVE COUNT 80% 0	1	2	3	4	5	6	7	
A	✓	✓	✓	✓6	✓	✓4	✓9	✓11	30	A	✓	✓	✓	✓2	✓1	✓4	✓8	✓9
B	✓	✓	✓	✓4	✓	✓	✓9	✓10	23	B	✓	✓	✓	✓2	✓	✓4	✓9	✓8
C	✓	✓	✓	✓4	✓4	✓	✓9	✓9	26	C	✓	✓	✓	✓3	✓	✓5	✓10	✓13
D	✓	✓	✓	✓3	✓	✓4	✓8	✓11	26	D	✓	✓	✓	✓4	✓4	✓	✓8	✓12
E	✓	✓	✓	✓4	✓	✓6	✓6	✓7	23	E	✓	✓	✓	✓3	✓	✓4	✓9	✓11
F	✓	✓	✓	✓2	✓4	✓7	✓1	✓9	23	F	✓	✓	✓2	✓2	✓	✓4	✓12	✓13
G	✓	✓	✓	✓2	✓	✓	✓8	✓8	23	G	✓	✓	✓1	✓2	✓	✓3	✓4	✓10
H	✓	✓	✓	✓2	✓4	✓	✓6	✓8	22	H	✓	✓	✓	✓3	✓	✓4	✓6	✓10
I	✓	✓	✓	✓2	✓4	✓0	✓	✓9	21	I	✓	✓	✓	✓2	✓	✓5	✓9	✓11
J	✓	✓	✓	✓	✓	✓3	✓	✓9	12	J	✓	✓	✓	✓3	✓3	✓	✓7	✓12
	(K)	(K)	(K)	(K)	(K)		(K)	(K)	229		(K)	(K)	(K)	(K)	(K)		(K)	(K) 259

AR302091

ANISM LOG # ____

P DATE: 04 NOV 88 CALIBRATED _____ ON SITE _____

ARTING DATE: 08 NOV 88 CALIBRATED _____ OTHER ASI FLEMINGTON N.J

BIO 1 UPSTREAM

DOSE %	LIVE COUNT 100 %								
	0	1	2	3	4	5	6	7	
A	✓	D	–	–	–	–	–	–	0
B	✓	✓	✓	✓4	✓	✓7	✓10	✓12	33
C	✓	✓	✓	✓3	✓	✓4	✓8	✓8	23
D	✓	✓	✓	✓3	✓	✓4	✓8	✓11	26
E	✓	✓	✓2	✓2	✓	✓3	✓7	✓8	22
F	✓	✓	✓	✓1	✓4	✓	✓8	✓10	23
G	✓	✓	✓	✓3	✓	✓6	✓5	✓9	23
H	✓	D	–	–	–	–	–	–	0
I	✓	✓	D	–	–	–	–	–	0
J	✓	✓	✓1	✓	✓3	✓9	D	–	13
	(K)	(K)	(K)	(K)	(K)		(K)	(K)	les

AR302092

ORGANISM LOG # _____

P DATE: 08 NOV 85 CALIBRATED _____ ON SITE _____

ARTING DATE: 08 NOV 85 CALIBRATED _____ OTHER ASI FLEMINGTON N.J.

BIO 1 UPSTREAM

DOSE %	DISSOLVED OXYGEN 0	1	2	3	4	5	6	7		D.O. AFTER 1	2	3	4	5	6	7
0	6.8	7.0	7.0	7.2	7.2	7.4	~~7.6~~		0	7.6	7.8	7.2	7.2	7.6	7.4	7.4
10	7.4	7.6	7.2	7.2	7.4	7.5	~~7.4~~		10	7.8	8.0	7.4	7.2	7.4	7.6	7.2
20	7.6	7.6	7.8	~~6.8~~ 7.8	7.4	7.7	~~7.4~~		20	7.6	8.0	7.4	7.2	7.4	7.6	7.2
40	8.0	8.0	8.0	7.2	7.6	8.2	7.4		40	7.8	7.9	7.6	7.2	~~7.4~~	7.6	7.4
60	8.2	8.2	8.8	8.0	8.0	8.6			60	7.6	7.8	7.4	7.0	7.2	7.6	7.4
80	8.4	8.6	9.4	8.6	8.0	8.4			80	7.6	8.0	7.4	7.0	7.5	7.6	7.4
100	8.6	8.6	9.0	9.2	8.0	9.2			100	7.6	7.9	7.4	7.2	7.4	7.6	7.4
	(K)	(K)	(K)	(K)	(K)		↕			(K)		(K)	(K)		(K)	(K)
							0 7.4									
							10 7.4									
							20 8.0									
							40 8.2									
							60 8.6									
							80 9.0									
							100 9.2									
							(K)									

AR302093

ORGANISM LOG # _____

ERM LOCATION HOMETOWN PA ORGANISM CERIO. DUBIA

UP DATE: 08 NOV 88 CALIBRATED ON SITE

ARTING DATE: 08 NOV 88 CALIBRATED OTHER ASI FLEMINGTON N.J.

BIO 1 UPSTREAM

DOSE %	pH								TEMPERATURE °C							
	0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7
0	7.7	7.7	7.7	7.7	7.7	7.8	7.8		25.0	24.0	25.0	24.5	25.0	25.0	25.0	
10	7.6	7.6	7.7	7.6	7.8	7.7	7.6		25.0	24.0	25.0	25.0	25.0	25.0	25.0	
20	7.5	7.5	7.6	7.6	7.7	7.6	7.5		25.0	24.0	24.5	25.0	25.0	25.0	25.0	
40	7.3	7.2	7.4	7.5	7.4	7.3	7.2		25.0	24.5	24.5	25.5	25.0	25.0	25.0	
60	7.1	7.0	7.2	7.2	7.1	7.1	6.9		24.5	24.5	24.0	25.5	25.0	25.0	25.0	
80	6.8	6.7	6.9	7.0	6.9	7.0	6.7		24.5	24.5	24.0	26.0	25.0	25.0	25.0	
100	6.5	6.5	6.5	6.7	6.7	6.8	6.5		24.0	24.5	24.0	25.5	25.0	25.0	25.0	

AR302094

ORGANISM LOG # _____

LOCATION Hometown 14 ORGANISM Ceriodaphnia

DATE: 11/8/88 CALIBRATED _____ ON SITE _____

STARTING DATE: 11/8/88 CALIBRATED _____ OTHER Flemington

Bio 1 Upstream

DOSE %	AK 0	1	2	3	4	5	6			Hardness 0	1	2	3	4	5	6		
0	40	40	40	40	40	40	40			48	52	52	50	50	48	52		
10																		
20																		
40																		
60																		
80																		
100	16	16	16	16	16 20@	12	24			28	32	32	32	32	36	36		
			K	K	K		K						K	K		K		

ORGANISM LOG # _____

LOCATION Hemetown KY ORGANISM Ceriodaphnia

P DATE: 11/8/88 CALIBRATED _____ ON SITE _____

ARTING DATE: 11/9/88 CALIBRATED _____ OTHER Flemington

Bio 1 Upstream

DOSE %	Conductivity 0	1	2	3	4	5	6	7
0	130	130	130	130	130	125	130	
10	120	120	120	130	120	120	130	
20	120	120	120	120	120	120	130	
40	110	110	110	110	110	110	120	
60	100	100	100	100	100	100	110	
80	90	90	90	90	90	85	100	
100	80	80	80	80	80	75	85	
			KC	KC	KC		KC	

AR302096

ORGANISM LOG # _____

5/89 Report

ORIGINAL
(RED)

ASI BIOMONITORING REPORT #749
ASI Job # 2119

7-DAY STATIC DAILY-RENEWAL SHORT-TERM CHRONIC TOXICITY TESTS WITH Ceriodaphnia dubia and Pimephales promelas

GENERAL

Test Facility: Aqua Survey, Inc.
499 Point Breeze Road
Flemington, New Jersey 08822
(201) 788-8700

Client: Environmental Resources Management, Inc.
Exton, PA
Laboratory Coordinator: Susan Barry

Date(s) of Toxicity Test: November 9-16, 1988 (P. promelas)
November 8-15, 1988 (C. dubia)

BACKGROUND

The two short-term (7-day) chronic toxicity tests described in this report were performed for Environmental Resources Management Inc. of Exton, Pennsylvania. These tests were conducted to determine the toxicity, if any, of surface water adjacent to the Eastern Diversified Metals site, Hometown, PA.

TOXICITY SUMMARY

Chronic toxicity tests conducted for ERM in November, 1988 with Ceriodaphnia dubia and the fathead minnow (Pimephales promelas) indicated that the test material was toxic to C. dubia only. Significantly increased mortality and reduced reproduction were found with C. dubia in the 80 and 100% treatments. C. dubia reproduction was not inhibited in treatments below 80%.

Fathead minnow larvae exhibited no significant mortality or growth reduction in any of the treatments.

302090a

METHODS

Effluent & Diluent Sampling:

Effluent- A grab sample of effluent was collected on 11/7/88 by ERM personnel. Samples were collected in 10-gallon polyethylene containers and immediately transported to the ASI Laboratory in Flemington, NJ.

Diluent- Water obtained from Round Valley Reservoir (Hunterdon County, NJ) was used as dilution water in the bioassays. This water was filtered to 0.45 um before use.

Testing:

Chronic toxicity tests were conducted in accordance with EPA Test Methods 1000.0 and 1002.0 (EPA/600/4-85/014, 1985). _Ceriodaphnia dubia (<24 hours old, within 4 hours) and Pimephales promelas (<24 hours old) were the test species used.

Experimental Design:

For C. dubia: 1 organism/test chamber, 10 replicates/treatment
1 control treatment and 10, 20, 40, 60, 80 & 100% effluent concentrations.

For P. promelas: 10 organisms/test chamber, 3 reps/treatment
1 control and 10, 20, 40, 60, 80 & 100% effluent concentrations.

Effects Measured:

For C. dubia: Survival (immobility) & reproduction

For P. promelas: Survival & Growth (weight)

RESULTS

Table 1. Results of 7-Day Survival and Reproduction Bioassay with Ceriodaphnia dubia.

Effl Conc	Day #	Repro/Replicate A	B	C	D	E	F	G	H	I	J	#Live Young	#Live Adults	Mean Young	Most Young
0%	2	0	0	0	1	0	0	0	0	0	0	1	10	0.1	1
	3	4	4	4	1	4	4	4	4	2	4	35	10	3.5	4
	4	7	5	6	2	0	0	8	0	4	5	37	10	3.7	8
	5	0	0	8	4	4	5	7	3	5	0	36	10	3.6	8
	6	8	9	0	7	8	8	0	7	D3	9	59	9	5.9	9
	7	14	9	0	0	10	10	9	11	-	10	73	9	7.3	14
		33	27	18	15	26	27	28	25	14	28	241			
10%	2	0	0	0	0	0	0	0	0	0	0	0	10	0.0	0
	3	3	4	4	4	4	5	0	0	5	4	33	10	3.3	5
	4	4	6	6	0	5	6	4	7	D	5	43	9	4.3	7
	5	0	0	0	7	0	7	8	8	-	0	30	9	3.0	8
	6	7	9	11	6	10	0	8	10	-	9	70	9	7.0	11
	7	7	12	12	8	12	12	0	0	-	11	74	9	7.4	12
		21	31	33	25	31	30	20	25	5	29	250			
20%	2	0	0	0	0	0	0	0	0	0	0	0	10	0.0	0
	3	D2	3	2	4	3	0	2	4	4	2	26	9	2.6	4
	4	-	7	5	3	4	4	0	0	7	2	32	9	3.2	7
	5	-	0	0	6	0	6	0	6	0	0	18	9	1.8	6
	6	-	7	10	7	7	9	9	9	13	D8	79	8	7.9	13
	7	-	8	11	11	10	11	11	7	12	-	81	8	8 1	12
		2	25	28	31	24	30	22	26	36	12	236			
40%	2	0	0	0	0	0	0	0	0	0	0	0	10	0.0	0
	3	3	3	2	0	3	0	4	3	4	4	26	10	2.6	4
	4	0	0	3	2	0	3	5	4	5	3	25	10	2.5	5
	5	6	5	0	3	6	6	0	0	D2	0	27	9	2.8	6
	6	6	9	7	4	D1	7	12	11	-	10	67	8	6.7	12
	7	7	7	9	0	-	8	10	12	-	10	63	8	6.3	12
		22	24	21	9	10	24	31	30	10	27	208			

Table 1. Results of 7-day Survival and Reproduction Bioassay with Ceriodaphnia dubia (continued).

Effl Conc	Day #	Repro/Replicate A	B	C	D	E	F	G	H	I	J	#Live Young	#Live Adults	Mean# Young	Most Young
60%	2	0	0	0	0	0	0	0	-	0	0	0	9	0.0	0
	3	3	0	2	3	0	2	0	-	0	2	12	9	1.2	3
	4	4	1	0	0	4	5	2	-	1	0	17	9	1.7	5
	5	0	4	1	5	4	0	3	-	3	2	22	9	2.2	5
	6	8	6	4	8	8	9	7	-	7	8	65	9	6.5	9
	7	9	4	0	10	9	11	1	-	6	9	59	9	5.9	11
		24	15	7	26	25	27	13	0	17	21	175			
80%	2	0	0	0	D	0	0	0	0	0	0	0	9	0.0	0
	3	D	1	0	-	0	4	2	0	0	0	7	8	0.7	4
	4	-	1	0	-	D2	0	3	0	0	0	6	7	0.6	3
	5	-	5	4	-	-	2	0	2	0	0	13	7	1.3	5
	6	-	7	5	-	-	7	3	1	2	3	28	7	2.8	7
	7	-	0	7	-	-	7	8	0	5	D	27	6	2.7	8
		0	14	16	0	2	20	16	3	7	3	81			
100%	2	0	0	0	D	0	D	D	0	0	0	0	7	0.0	0
	3	D	D	D	-	D	-	-	D	D	0	0	1	0.0	0
	4	-	-	-	-	-	-	-	-	-	D	0	0	0.0	0
	5	-	-	-	-	-	-	-	-	-	-	0	0	0.0	0
	6	-	-	-	-	-	-	-	-	-	-	0	0	0.0	0
	7	-	-	-	-	-	-	-	-	-	-	0	0	0.0	0
		0	0	0	0	0	0	0	0	0	0	0			

RESULTS (continued)

Table 2. Results of 7-Day Survival and Growth Bioassay with Fathead Minnow Larvae (Pimephales promelas).

Test Concentration (%) & Replicate	Survival (%)	Average Dry Weight (mg)
0 a	90	0.034
b	100	0.032
c	100	0.031
10 a	100	0.032
b	100	0.030
c	100	0.031
20 a	100	0.035
b	90	0.033
c	100	0.028
0 a	100	0.033
b	90	0.041
c	100	0.030
60 a	90	0.041
b	90	0.036
c	100	0.036
80 a	90	0.042
b	90	0.038
c	100	0.039
100 a	90	0.026
b	80	0.035
c	90	0.037

DATA ANALYSIS

Data from the chronic bioassay of C. dubia demonstrated that statistically significant mortality and reduced reproduction was caused by the effluent in the 80 and 100% treatments ($p = 0.5$). The NOEC = 60% and LOEC = 80% for C. dubia, with a chronic value (ChV) of 69.3%.

Data from the chronic bioassay of P. promelas. indicated that there was no statistically significant mortality or growth reduction in any of the treatments. The NOEC, LOEC and ChV are therefore not calculable.

Cindy Roberts
Chronic Studies Manager

SET-UP DATE: 09 NOV. 88 CALIBRATED _____ ON SITE _____ ORIGINAL (RED)

STARTING DATE: 09 NOV. 88 CALIBRATED _____ OTHER ASI FLEMINGTON N.J.

BIO 2 DOWNSTREAM

DOSE %	LIVE COUNT 0% 0	1	2	3	4	5	6	7	LIVE COUNT 10% 0	1	2	3	4	5	6	7
0 A	10	10	10	10	10	9	9	9	10A 10	10	10	10	10	10	10	10
B	10	10	10	10	10	10	10	10	B 10	10	10	10	10	10	10	10
C	10	10	10	10	10	10	10	10	C 10	10	10	10	10	10	10	10
					20%								40%			
20 A	10	10	10	10	10	10	10	10	40A 10	10	10	10	10	10	10	10
B	10	10	10	10	10	10	9	9	B 10	10	10	10	10	10	9	9
C	10	10	10	10	10	10	10	10	C 10	10	10	10	10	10	10	10
					60%								80%			
60 A	10	10	10	9	9	9	9	9	80A 10	10	10	10	10	9	9	9
B	10	10	10	10	10	10	10	10	B 10	10	10	9	9	9	9	9
C	10	10	10	10	10	10	10	10	C 10	10	10	10	10	10	10	10
					100%											
10 A	10	10	10	9	9	9	9	9								
B	10	10	10	8	8	8	8	8								
C	10	10	10	10	10	10	10	9								

ORGANISM LOG # _____

302090.9

ING DATE: 09 NOV 88 CALIBRATED _____ OTHER ASI FLEMINGTON N.J.

ORIGINAL
(RED)

BIO 2 DOWNSTREAM

DOSE %	pH									TEMPERATURE °C.								
	0	1	2	3	4	5	6	7			0	1	2	3	4	5	6	7
0	7.7	7.7	7.7	7.9	7.9	7.9	7.9			0	26.0	25.0	24.5	25.0	25.0	25.0	25.0	
10	7.7	7.6	7.6	7.8	7.8	7.7	7.8			10	26.0	25.5	25.0	25.0	25.0	25.0	25.0	
20	7.5	7.6	7.5	7.7	7.5	7.5	7.6			20	26.0	25.5	25.0	25.0	25.0	25.0	25.0	
40	7.3	7.4	7.4	7.5	7.4 7.5	7.4	7.6			40	25.0	25.0	25.0	25.0	25.0	25.0	25.0	
60	7.2	7.2	7.3	7.4	7.3	7.3	7.5			60	25.0	24.5	25.0	25.0	25.0	25.0	25.0	
80	7.1	7.1	7.3	7.3	7.2	7.2	7.4			80	25.0	24.0	25.5	25.0	25.0	25.0	25.0	
100	7.0	7.1	7.2	7.2	7.1	7.1	7.4			100	25.0	24.0	25.5	25.0	25.0	25.0	25.0	
	(E)	(E)	(E)	(E)		(E)	(E)				(E)	(E)	(E)	(E)		(E)	(E)	

ORGANISM LOG # _____

302098h

DATE: 04 NOV 88 CALIBRATED _____ ON SITE _____ ORIGINAL (RED)

ING DATE: 05 NOV 88 CALIBRATED _____ OTHER ASI FLEMINGTON N.J.

BIO 2 DOWNSTREAM

DOSE %	DISSOLVED OXYGEN							
	0	1	2	3	4	5	6	7
0	7.2	7.2	7.2	6.8	7.3	7.0	6.6	
10	7.6	7.4	7.2	6.8	7.4	7.4	6.6	
20	7.4	7.4	7.6	7.0	7.4	7.6	6.8	
40	7.8	7.8	8.0	7.4	8.0	8.0	7.0	
60	8.0	8.0	8.4	7.6	8.0	8.6	7.4	
80	8.2	8.4	8.8	8.0	8.6	9.0	8.0	
100	8.2	8.6	9.4	8.6	9.0	9.4	8.2	
	(K)	(K)	(K)	(K)		(K)	(K)	

ORGANISM LOG / _____

302093

ATE: 07 NOV 87 CALIBRATED _____ ON SITE _____ ORIGINAL (RED)

ING DATE: 08 NOV 87 CALIBRATED _____ OTHER ASI FLEMINGTON N.J.

BIO 2 DOWNSTREAM

DOSE %	D.O. AFTER 1	2	3	4	5	6	7		D.O. AFTER (cont'd) 1	2	3	4	5	6	7
0 A	7.2	7.0	7.0	7.8	7.4	7.0	6.8	100 A	7.2	6.6	7.0	6.8	7.4	7.0	6.4
B	7.0	7.0	7.2	7.2	7.2	7.2	6.6	B	7.4	7.0	7.0	7.0	7.0	6.6	6.8
C	7.2	7.2	7.2	7.4	7.2	7.4	6.6	C	7.2	7.0	7.2	7.1	7.0	6.8	7.4
0 A	7.0	6.8	7.4	7.0	7.0	7.0	7.0		(K)	(K)	(K)	←	(K)	(K)	(K)
B	7.4	7.0	7.2	7.0	7.0	7.0	6.4								
C	7.0	6.6	7.2	7.0	7.2	7.0	7.2								
60 A	7.2	7.0	7.2	7.1	7.2	7.2	6.8								
B	7.2	7.0	7.0	7.1	7.2	7.2	7.0								
C	7.2	7.0	7.2	7.1	7.0	7.2	7.4								
40 A	7.0	6.8	7.4	7.0	7.4	7.2	7.0								
B	7.4	7.0	7.2	7.0	7.2	7.0	7.4								
C	7.4	7.0	7.2	7.0	7.0	7.0	6.6								
60 A	7.4	7.0	7.2	7.0	7.4	7.2	6.8								
B	7.0	6.8	7.4	7.0	7.2	7.0	6.8								
C	7.0	7.0	7.0	7.1	7.0	7.2	6.6								
80 A	7.4	7.0	6.6	7.6	7.6	7.4	6.6								
B	7.4	7.0	7.0	7.6	7.4	7.4	6.4								
C	7.2	7.0	7.0	7.4	7.6	7.0	6.6								
	(K)	(K)	(K)	←	(K)	(K)						←			

GANISM LOG # _____

30 [illegible]

ATE: 08 NOV XX CALIBRATED _____ ON SITE _____ ORIGINAL (RED)

NG DATE: 07 NOV '88 CALIBRATED _____ OTHER Flemington

Bio 2 Downstream

DOSE %	Alk							Hardness						
	0	1	2	3	4	5	6	0	1	2	3	4	5	6
0	40	40	40	40	40	40	44	52	52	50	52	48	52	52
10														
20														
40														
60														
80				44										
00	72	56	52	48	48	56	52	84	84	86	88	80	180	90
			K	K		K	K			K	K		K	K

SM LOG # _____

302093K

ATE: 11/9/88 CALIBRATED _____ ON SITE _____

NG DATE: 11/8/88 CALIBRATED _____ OTHER Flemington (RED) ORIGINAL

Bin 2 Downstream

DOSE %	Conductivity 0	1	2	3	4	5	6
0	130	130	130	130	130	140	140
10	130	140	140	130	130	140	140
20	130	140	140	130	135	150	145
40	140	140	140	140	140	150	150
60	150	150	150	150	150	160	160
80	160	160	160	150	150	175	170
100	160	160	160	160	160	180	175
		(E)	(R)	(E)		(E)	(R)

ORGANISM LOG # _____

302090

SET UP DATE: OK NOV '8K CALIBRATED _____ ON SITE _____ ORIGINAL (RED)

STARTING DATE: OK NOV '8K CALIBRATED _____ OTHER ASI FLEMINGTON N.J.

BIO 2 DOWNSTREAM

DOSE %	LIVE COUNT 0 %								
	0	1	2	3	4	5	6	7	
A	✓	✓	✓	✓4	✓7	✓	✓8	✓14	33
B	✓	✓	✓	✓4	✓5	✓	✓9	✓9	27
C	✓	✓	✓	✓4	✓6	✓8	✓	✓	18
D	✓	✓	✓1	✓1	✓2	✓4	✓7	✓	16
E	✓	✓	✓	✓4	✓	✓4	✓8	✓10	26
F	✓	✓	✓	✓4	✓	✓5	✓8	✓10	27
G	✓	✓	✓	✓4	✓8	✓7	✓	✓9	28
H	✓	✓	✓	✓4	✓	✓3	✓7	✓11	25
I	✓	✓	✓	✓2	✓4	✓5	D3	–	14
J	✓	✓	✓	✓4	✓5	✓	✓9	✓10	28
	(K)	(K)	(K)	(K)	(K)		(K)	(K)	241

DOSE %	LIVE COUNT 10 %								
	0	1	2	3	4	5	6	7	
A	✓	✓	✓	✓3	✓4	✓	✓7	✓7	
B	✓	✓	✓	✓4	✓6	✓	✓9	✓12	
C	✓	✓	✓	✓4	✓6	✓	✓11	✓12	
D	✓	✓	✓	✓4	✓	✓7	✓6	✓8	2
E	✓	✓	✓	✓4	✓5	✓	✓10	✓12	3
F	✓	✓	✓	✓5	✓6	✓7	✓	✓12	3
G	✓	✓	✓	✓	✓4	✓8	✓8	✓	25
H	✓	✓	✓	✓	✓7	✓8	✓10	✓	25
I	✓	✓	✓	✓5	D	–	–	–	5
J	✓	✓	✓	✓4	✓5	✓	✓9	✓11	25
		(K)	(K)	(K)	(K)	(K)		(K)	(K) 25

ORGANISM LOG / _____

302090m

DATE: 04 NOV 82 CALIBRATED _____ OTHER ASI FLEMINGTON N.J

ORIGINAL
(RED)

BIO 2 DOWNSTREAM

DOSE %	LIVE COUNT 20 %										LIVE COUNT 40 %									
	0	1	2	3	4	5	6	7			0	1	2	3	4	5	6	7		
A	✓	✓	✓ ✗	D 2	-	-	-	-		2	A	✓	✓	✓	✓ 3	✓	✓ 6	✓ 6	✓ 7	22
B	✓	✓	✓	✓ 3	✓ 7	✓	✓ 7	✓ 8		25	B	✓	✓	✓	✓ 3	✓	✓ 5	✓ 9	✓ 7	24
C	✓	✓	✓	✓ 2	✓ 5	✓	✓ 10	✓ 11		28	C	✓	✓	✓	✓ 2	✓ 3	✓	✓ 7	✓ 9	21
D	✓	✓	✓	✓ 4	✓ 3	✓ 6	✓ 7	✓ 11		31	D	✓	✓	✓	✓	✓ 2	✓ 3	✓ 4	✓ 9	
E	✓	✓	✓	✓ 3	✓ 4	✓	✓ 7	✓ 10		24	E	✓	✓	✓	✓ 3	✓	✓ 6	D 1	-	10
F	✓	✓	✓	✓	✓ 4	✓ 6	✓ 9	✓ 11		30	F	✓	✓	✓	✓	✓ 3	✓ 6	✓ 7	✓ 8	24
G	✓	✓	✓	✓ 2	✓	✓	✓ 9	✓ 11		22	G	✓	✓	✓	✓ 4	✓ 5	✓	✓ 12	✓ 10	31
H	✓	✓	✓	✓ 4	✓	✓ 6	✓ 9	✓ 7		26	H	✓	✓	✓	✓ 3	✓ 4	✓	✓ 10 (1)	✓ 12	30
I	✓	✓	✓	✓ 4	✓ 7	✓	✓ 13	✓ 12		36	I	✓	✓	✓	✓ 4	✓ 5	D/1	-		10
J	✓	✓	✓	✓ 2	✓ 2	✓	D 8	-		12	J	✓	✓	✓	✓ 4	✓ 3	✓	✓ 10	✓ 10	27
	(K)	(K)	(K)	(K)	(K)		(K)	(K)		230		(K)	(K)	(K)	(K)	(K)		(K)	(K)	20

ORGANISM LOG / _____

302090

DATE: 08 NOV 88 CALIBRATED ____ ____ ____

DATE: 08 NOV 88 CALIBRATED ____ ____ ASI FLEMINGTON, N.J.

ORIGINAL
(RED)

BIO 2 DOWNSTREAM

DOSE %	LIVE COUNT 60%									LIVE COUNT 80%								
	0	1	2	3	4	5	6	7			0	1	2	3	4	5	6	7
A	✓	✓	✓	✓3	✓4	✓	✓8	✓9	24	A	✓	✓	✓	D	—	—	—	—
B	✓	✓	✓	✓	✓1	✓4	✓6	✓4	15	B	✓	✓	✓	✓D	✓1	✓5	✓7	✓
C	✓	✓	✓	✓2	✓	✓1	✓4	✓	7	C	✓	✓	✓	✓	✓	✓4	✓5	✓7
D	✓	✓	✓	✓3	✓	✓5	✓8	✓10	26	D	✓	✓	D	—	✓	—	—	—
E	✓	✓	✓	✓	✓(1)	✓4	✓8	✓9	25	E	✓	✓	✓	✓	D2	—	—	—
F	✓	✓	✓	✓2	✓5	✓	✓9	✓11	27	F	✓	✓	✓	✓4	✓	✓2	✓7	✓
G	✓	✓	✓	✓	✓2	✓3	✓7	✓1	13	G	✓	✓	✓	✓2	✓3(1)	✓	✓21	✓8
H	✓	D	—	—	—	—	—	—	0	H	✓	✓	✓	✓	✓	✓2	✓1	✓
I	✓	✓	✓	✓	✓1	✓3	✓7	✓6	17	I	✓	✓	✓	✓	✓	✓	✓2	✓
J	✓	✓	✓	✓2	✓	✓2	✓8	✓9	21	J	✓	✓	✓	✓	✓	✓	✓3	D
	KW	KW	KW	KW	KW		KW	KW	173		KW	KW	KW	KW	KW		KW	KW

ORGANISM LOG # ____

3020960

DATE: 08 NOV 88 CALIBRATED _____ ON SITE _____ ORIGINAL (RED)

DATE: 08 NOV 88 CALIBRATED _____ OTHER ASI FLEMINGTON N.J

BIO 2 DOWNSTREAM

DOSE %	LIVE COUNT 100 %								
	0	1	2	3	4	5	6	7	
A	✓	✓	D	-	-	-	-	-	0
B	✓	✓	D	-	-	-	-	-	0
C	✓	✓	D	-	-	-	-	-	0
D	✓	D	-	-	-	-	-	-	0
E	✓	✓	D	-	-	-	-	-	0
F	✓	D	-	-	-	-	-	-	0
G	✓	D	-	-	-	-	-	-	0
H	✓	✓	D	-	-	-	-	-	0
I	✓	✓	D	-	-	-	-	-	0
J	✓	✓	✓	D	-	-	-	-	0
	(K)	(K)	(K)	(K)					

ORGANISM LOG # _____

302090

AG DATE: OCT NOV 85 CALIBRATED _____ OTHER ASJ FLEMINGTON, N.J.

ORIGINAL
(RED)

BIO 2 DOWNSTREAM

DOSE %	pH								TEMPERATURE °C							
	0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7
0	7.7	7.7	7.7	7.7	7.9	7.9	7.9		0	24.5	26.0	25.0	24.5	25.0	25.0	25.0	
10	7.6	7.7	7.6	7.6	7.8	7.8	7.7		10	24.5	26.0	25.5	25.0	25.0	25.0	25.0	
20	7.4	7.5	7.6	7.5	7.7	7.5	7.5		20	24.0	26.0	25.5	25.0	25.0	25.0	25.0	
40	7.3	7.3	7.4	7.4	7.5	7.4	7.4		40	24.0	25.0	25.0	25.0	25.0	25.0	25.0	
60	7.1	7.2	7.2	7.3	7.4	7.3	7.3		60	24.0	25.0	24.5	25.0	25.0	25.0	25.0	
80	7.1	7.1	7.1	7.3	7.3	7.2	7.2		80	24.0	25.0	24.0	25.5	25.0	25.0	25.0	
100	7.0	7.0	7.1	7.2	–	–	–	–	100	24.0	25.0	24.0	25.5	25.0	–	–	–
	(K)	(K)	(K)	(K)	(K)		(K)			(K)	(K)	(K)	(K)	(K)		(K)	

ORGANISM LOG # _____

302098

DATE: OCT NOV 88 CALIBRATED _____ ON SITE _____

OTHER ASI FLEMINGTON, N.J.

ORIGINAL
(RED)

BIO 2 DOWNSTREAM

DOSE %	DISSOLVED OXYGEN									D.O. AFTER							
	0	1	2	3	4	5	6	7			1	2	3	4	5	6	7
0	6.4	7.2	7.2	7.2	6.8	7.3	7.0	X		0	7.6	7.4	7.4	7.4	7.8	7.8	7.2
10	7.2	7.6	7.4	7.2	6.8	7.4	7.4			10	7.8	7.4	7.4	7.4	7.6	7.6	7.2
20	7.2	7.4	7.4	7.6	7.6	7.4	7.6			20	7.8	7.4	7.4	7.4	7.6	7.6	7.2
40	7.6	7.8	7.8	8.0	7.4	8.0	8.0			40	7.8	7.4	7.2	7.4	7.4	7.6	7.6
60	8.0	8.0	8.0	8.4	7.6	8.0	8.6			60	7.6	7.4	7.4	7.4	7.4	7.6	7.4
80	8.4	8.2	8.4	8.8	8.0	8.6	9.0			80	7.4	7.4	7.4	7.2	7.4	7.6	7.2
100	8.4	8.2	8.6	9.4	–	–	–	–		100	7.6	7.6	7.4	–	–	–	–
	(K)	(K)	(K)	(K)			(K)				(K)	(K)	(K)	(K)		(K)	

ORGANISM LOG / _____

302098r

AG DATE: 11/8/88 CALIBRATED _____ OTHER Flemington

ORIGINAL (RED)

Bio 2 Downstream

DOSE %	Alk 0	Alk 1	Alk 2	Alk 3	Alk 4	Alk 5	Alk 6	Hardness 0	Hardness 1	Hardness 2	Hardness 3	Hardness 4	Hardness 5	Hardness 6
0	40	40	40	40	40	40	40	48	52	52	50	52	48	52
10														
20														
40														
60														
80					44	48	52					80	80	76
100	52	72	56	52	-	-	-	88	84	84	86	-	-	-
			(K)	(K)	(K)		(K)			(K)	(K)	(K)		(K)

ORGANISM LOG # _____

302096s

LOCATION HOMESTEAD PA ORGANISM CERIO : DUBIA

ATE: 08 NOV '88 CALIBRATED _____ ON SITE _____ ORIGINAL (RED)

ING DATE: 08 NOV '88 CALIBRATED _____ OTHER ASZ FLEMINGTON N.J

BIO 2 DOWNSTREAM

DOSE %	CONDUCTIVITY 0	1	2	3	4	5	6
0	130	130	130	150	130	130	140
10	130	130	140	140	130	130	140
20	140	130	140	140	130	135	150
40	140	140	140	140	140	140	150
60	150	150	150	150	150	150	160
80	160	160	160	160	150	150	175
100	160	160	160	-	-	-	-

URGANISM LOG / _____

302090